



# New Horizons

## The First Mission to the Pluto System and the Kuiper Belt

### **Voyage to Unexplored Pluto and a New Realm**

The New Horizons mission will help us understand worlds at the edge of our solar system by making the first reconnaissance of the Pluto system and by venturing deeper into the distant, mysterious Kuiper Belt – a relic of solar system formation.

### **The Journey**

New Horizons launched on Jan. 19, 2006; it swung past Jupiter for a gravity boost and scientific studies in February 2007, and is conducting a six-month-long reconnaissance flyby study of Pluto and its moons that started in early 2015. Pluto closest approach occurs on July 14, 2015. If NASA approves an extended mission, the spacecraft could head farther into the Kuiper Belt to examine one or two of the ancient, icy mini-worlds in that vast region, at least a billion miles beyond Neptune's orbit.

Sending a spacecraft on this long journey will help us answer basic questions about the surface properties, geology, interior makeup and atmospheres on these bodies.

### **New Science**

The National Academy of Sciences has ranked the exploration of the Kuiper Belt – including Pluto – of the highest priority for solar system exploration.



Artist's concept of the New Horizons spacecraft and Pluto-Charon

Generally, New Horizons seeks to understand where Pluto and its moons "fit in" with the other objects in the solar system, such as the inner rocky planets (Earth, Mars, Venus and Mercury) and the outer gas giants (Jupiter, Saturn, Uranus and Neptune).

Pluto and its largest moon, Charon, belong to a third category known as "ice dwarfs." They have solid surfaces but, unlike the terrestrial planets, a significant portion of their mass is icy material.

Using Hubble Space Telescope images, New Horizons team members have discovered four previously unknown moons of Pluto: Nix, Hydra, Styx and Kerberos.

A close-up look at these worlds from a spacecraft promises to tell an incredible story about the origins and outskirts of our solar system. New Horizons also will explore – for the first time – how ice dwarf planets like Pluto and Kuiper Belt bodies have evolved over time.

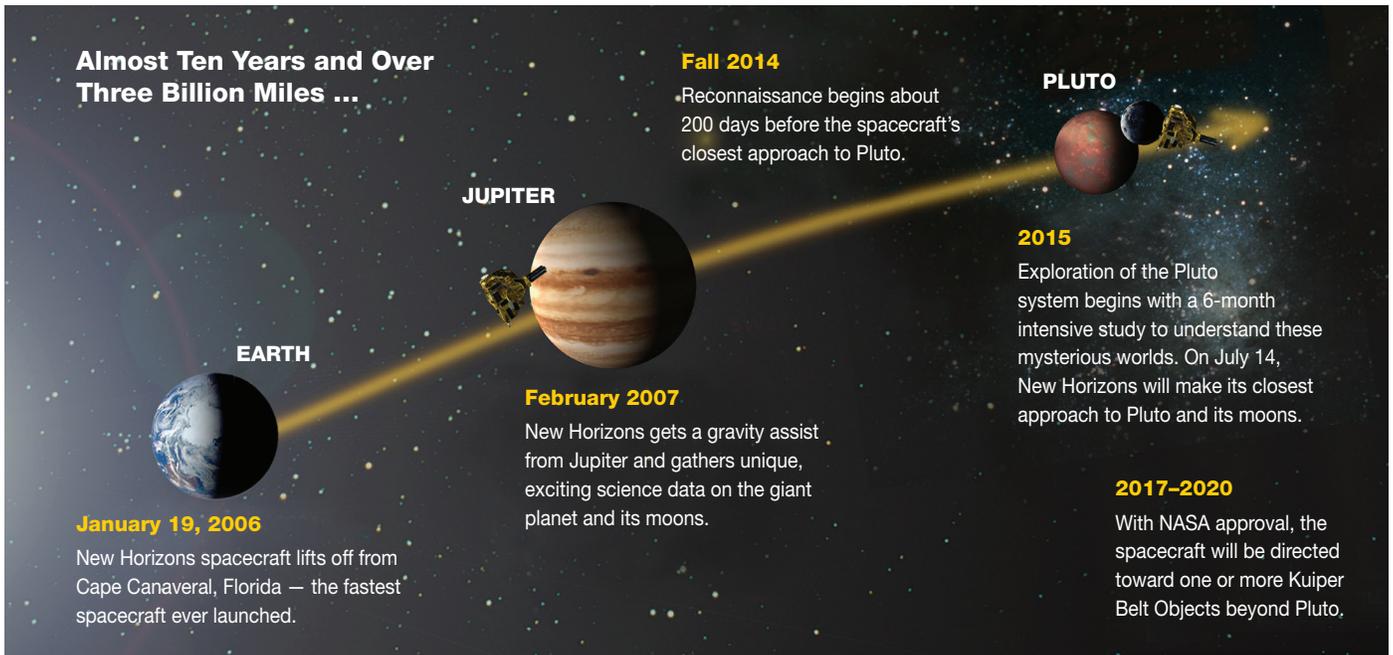
### **The Need to Explore**

The United States has been the first nation to reach every planet from Mercury to Neptune with a space probe. If New Horizons is successful, it will allow the U.S. to complete the initial reconnaissance of the solar system.

### **A Team Approach**

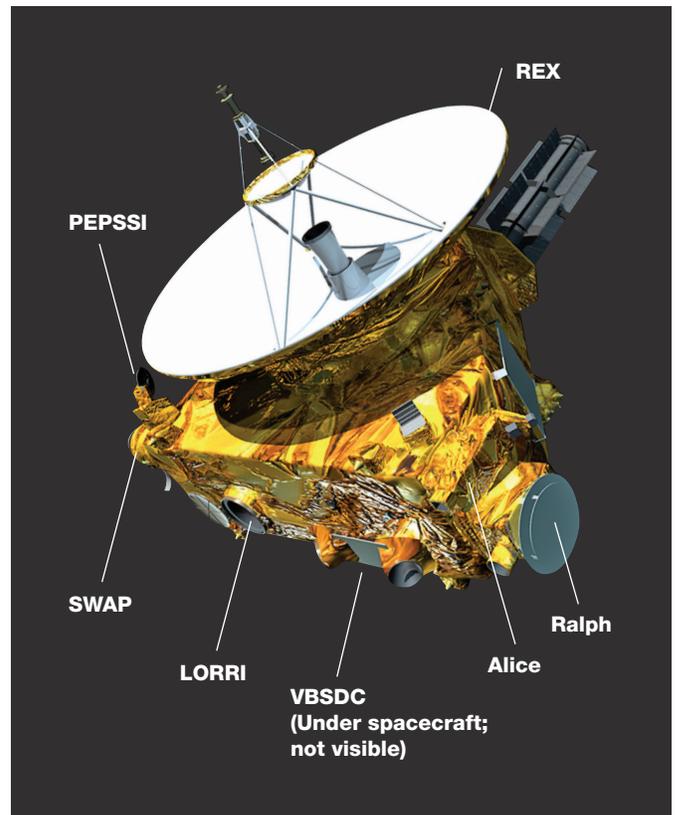
Principal Investigator Dr. Alan Stern, of Southwest Research Institute (SwRI), leads the mission team. The Johns Hopkins University Applied Physics Laboratory (APL) manages the mission for NASA, and designed, built and operates the spacecraft. SwRI is responsible for science payload operations, and data reduction and archiving, and participates in the science team. The mission team also includes KinetX, Inc. (navigation team), Ball Aerospace Corporation, the Boeing Company, NASA Goddard Space Flight Center, NASA Jet Propulsion Laboratory, Stanford University, Lockheed Martin Corporation, University of Colorado, the U.S. Department of Energy and a number of other firms, NASA centers and university partners.

**NASAfacts**



### Science Payload

- Ralph: Visible and infrared imager/spectrometer; provides color, composition and thermal maps.
- Alice: Ultraviolet imaging spectrometer; analyzes composition and structure of Pluto's atmosphere and looks for atmospheres around Charon and Kuiper Belt Objects (KBOs).
- REX (Radio Science EXperiment): Measures atmospheric composition and temperature; passive radiometer.
- LORRI (Long Range Reconnaissance Imager): Telescopic camera; obtains encounter data at long distances, maps Pluto's far side and provides high resolution geologic data.
- SWAP (Solar Wind Around Pluto): Solar wind and plasma spectrometer; measures atmospheric "escape rate" and observes Pluto's interaction with solar wind.
- PEPSSI (Pluto Energetic Particle Spectrometer Science Investigation): Energetic particle spectrometer; measures the composition and density of plasma (ions) escaping from Pluto's atmosphere.
- VBSDC (Venetia Burney Student Dust Counter): Built and operated by students at University of Colorado; measures the space dust peppering New Horizons during its voyage across the solar system.



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<http://www.nasa.gov/newhorizons>

<http://pluto.jhuapl.edu>